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ABSTRACT

This paper reviews 18 microcomputer software item banks on an individual basis. Software Programs reviewed are AIMS (Academic Instructional Measurement System); CREATE-A-TEST; Exam Builder; Exams and Examiner; MicroCAT; Multiple Choice Files; P.D.Q. Builder; Quiz Rite; Teacher Create Series (5 programs); TAP (Testing Authoring Program); TestBank Test Rite; Testmaster; Testmaster Series; Tests, Caicreate, Caitake; Tests Made Easy; TestWorks; and the Sage. Each review devotes one to three paragraphs to the following areas: (1) general program description; (2) item bank; (3) item bank maintenance; (4) test assembly; (5) test administration and scoring; (6) student recordkeeping; and (7) test use. Two tables summarize the reviews and allow for software comparisons. Table 1 provides the program title; the vendor name and address; the computer used and major features; and list price of software. Table 2 gives a brief overview of the reviews in chart form. (LMO)

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REVIEWS OF MICROCOMPUTER ITEM BANKING SOFTWARE

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U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

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Table 1

SUMMARY OF ITEM BANKING PROGRAMS REVIEWED

Program Title	Vendor	Computer	Major Features	List Price
CREATE-A A-TEST	Cross Educational Software 1802 N. Trenton Ruston, LA 71270	Apple	Item Bank Maintenance Test Assembly	$ 90 $ 50/item bank
Multiple Choice Files	Compu-tations P.O. Box Troy, MI 48099	Apple Atari	Maintenance Administration	$ 30
P.D.Q. Builder	Micro Power and Light Company 12820 Hillcrest Road #219 Dallas,TX 75230	Apple	Maintenance Test assembly Administration	$ 45
Quiz Rite	Class 1 Systems 17909 Maple Street Lansing, IL 60438	Apple TRS-80 IBM-PC	Maintenance Test Assembly	$ 90
Test Rite	Class 1 Systems 17909 Maple Street Lansing, IL 60438	Apple TRS-80 IBM-PC	Maintenance Test assembly	$139
Test-master	Midwest Software P.O. Box 214 Farmington, MI 48024	Apple CBM Commodore	Maintenance Test assembly	$ 35
Test-master Series	D.E.C. Computing 5307 Lynnwood Drive West Lafayette, IN 47906	IBM-PC Apple TRS-80	Item bank	$ 20/item bank
Tests Caicreat Caitake	EduSystems 3224 Lakeland Drive Berrien Springs, MI 49103	IBMPC	Maintenance Test assembly Administration	$ 75 Tests $100 All three
The Sage	Jagdstaffel Software 645 Brenda Lee Drive San Jose, CA 95123	Apple	Maintenance Administration	$ 62

Table 1 -- Cont'd

SUMMARY OF ITEM BANKING PROGRAMS REVIEWED

Program Title	Vendor	Computer	Major Features	List Price
AIMS	Charles Merrill Pub. Co. Test Division 1300 Alum Creek Dr. Box 508 Columbus, OH 43218	IBM PC-XT	Maintenance Test Assembly Item Bank	$900 min. (with items)
Exam Builder	A. U. Software P.O. Box 597 Colleyville, TX 76034	TRS-80 Commodore Apple IBM PC	Test Assembly Maintenance	$100
Exams and Examiner	Microsoftware Services P.O. Box 776 Harrisonburg, VA 22801	TRS-80	Maintenance Administration	$ 70 each $130 both
MicroCAT	Assessment Systems Corp. 2233 University Ave. Suite 310 St. Paul, MN 55114	IBM PC	Test Assembly Maintenance Administration	$975 and more
TAP	Addison-Wesley Pub. Co. Medical-Nursing Division 2727 Sand Hill Road Menlo Park, CA 94025	IBM PC	Item Bank Maintenance Test Assembly Administration	$125
Teacher Create Series (5 Programs)	Educational Courseware 67A Willard St. Hartford, CT 06105	Apple	Administration Maintenance	NA
TestBank	Holt, Rhinehart, & Winston 383 Madison Ave. New York, NY 10017	Apple	Item Bank Maintenance Test Assembly	NA
Tests Made Easy	Compu-tations P.O. Box 502 Troy, MI 48099	Apple	Test Assembly Maintenance	$ 30
TestWorks	Milliken Publishing Co. 1100 Research Blvd. P.O. Box 21579 St. Louis, MO 63132	Apple	Maintenance Test Assembly Administration	$250

Table 2

	AIMS	Create-a-Test	Exam Builder	Exams& Examiner	MicroCAT	Multiple Choice Files	P. D. Q. Builder	Quiz Rite	TAP	The Sage
Item Bank Description										
May purchase item banks	X	X				X			X	
Use various response formats	X	X					X	X	X	
Link text passage to items	X				X				X	
Store classification scheme	X			X	X				X	
Allow more than 4 lines for item stem	X	X	X	X	X	X		X	X	X
Item Bank Maintenance										
Create and edit items	X	X	X	X	X	X	X	X	X	X
Use full-screen editing	X	X			X				X	
Store usage history									X	
Calculate item statistics					X					
Test Assembly										
Select by item number	X	X	X	X	X			X	X	
Select randomly	X		X	X		X	X			
Select by classification	X			X	X				X	
Print multiple forms	X								X	
Support special characters	X	X			X					
Administration and Scoring										
Administer test on-line				X	X	X	X			X
Support scanner										
Compute totals on test				X	X	X	X			X
Determine objective mastery					X					
Student Recordkeeping										
Use objectives approach										
Use gradebook approach				X	X		X			X
Use Factors										
Comprehensive manual	NA	X		X	X		X	NA	X	
Easy to Use	NA		X			X	X	X	X	
Reasonable performance	NA	X	X				X	X	X	X

Table 2 -- Cont'd

	Teacher Create	Test Bank	Test Rite	Tests	Tests Made Easy	Test-master	Testmaster Series	TestWorks
Item Bank Description								
May purchase item banks		X					X	
Use various response formats		X	X	X	X			
Link text passage to items		X		X				
Store classification scheme		X	X	X			X	
Allow more than 4 lines for item stem		X	X	X	X	X		X
Item Bank Maintenance								
Create and edit items	X	X	X	X	X	X		X
Use full-screen editing		X		X		X		
Store usage history								X
Calculate item statistics								X
Test Assembly								
Select by item number		X	X	X	X	X		X
Select randomly		X		X	X	X		X
Select by classification		X	X	X			X	
Print multiple forms		X	X	X	X		X	
Support special characters		X						
Administration and Scoring								
Administer test on-line	X			X	X		X	
Support scanner								
Compute totals on test	X				X		X	
Determine objective mastery								X
Student Recordkeeping								
Use objectives approach								
Use gradebook approach								X
Use Factors								
Comprehensive manual	X	X	X	X		X	NA	X
Easy to use	X	X	X	X	X	X	NA	X
Reasonable performance		X	X		X	X	NA	X

PRODUCT: AIMS: Academic Instructional Measurement System

VENDOR: Charles E. Merrill Publishing Co.
Test Division
1300 Alum Creek Drive
Box 508
Columbus, OH 43216

GENERAL DESCRIPTION

AIMS is an item bank maintenance program which comes with any of four Charles Merrill item banks for primary and secondary educators. The principle use of AIMS is for classroom testing with the provided items or the teacher's own items. Since the items provided with AIMS are norm and criterion referenced, tests can be constructed for diagnosis or minimum competency.

In order to use this package, an IBM-PC XT or AT or compatible computer with at least 10 MB hard disk is required. An Epson FX80 printer is needed in order to print special characters.

The program sells for $600 and must be purchased with an item bank. Item banks sell for between $300 and $2,300. Items may be purchased separately (printed copy) and cover reading/language arts and mathematics for grades 1-8 or 9-12. The complete system costs $3,600. A test development guide is also available for $40; it is a complete guide for developing norm or criterion referenced tests for classrooms, schools, or districts.

The actual program and manual were not available for review from the publisher. This product discription is based on promotional materials and conversations with a Charles Merrill programer.

ITEM BANK DESCRIPTION

Item storage can be in any format desired. Questions and answers are stored together, allowing the user to store fill-in-the-blank and essay questions as well as multiple-choice. Reading passages may be stored as test items and can be of any length.

Items are stored in six "layers": the text, any available item statistics, the objective which the item measures, a classification scheme, associated passages, and any directions. All layers are linked together. Printed artwork comes with each item bank and is linked by item code to the correct items. Purchased items include statistics, objectives, and classifications.

ITEM BANK MAINTENANCE

A full-screen editor available through another distributor is incorporated into AIMS. This program provides complete item entry and editing capabilities. The instructor can use upper and lower case, underlining, superscripts, subscripts, and other special characters not normally available with item bank editors.

TEST ASSEMBLY

There are several options available for assemblying tests. The user can predetermine which items will be used and select on those items. A second method would be to choose objectives to be measured and allow the computer to select randomly from within objectives. Thirdly, tests can be constructed with specific statistical parameters by selecting items based on their difficulty, discrimation, and item-total correlations. All item statistics for user-developed items must be calculated elsewhere, but may be stored with each item.

TEST ADMINISTRATION AND SCORING

Printed tests are camera ready and can be presented by photocopying for a single class or professional printing for a school or district.

There is no provision for on-line testing or computer scoring.

STUDENT RECORDKEEPING

There is no provision for recording student scores.

USE

Neither the manual nor the program disk were made available for review.

PRODUCT: CREATE-A-TEST

AUTHOR: Create-a-Test Company
80 Tilley Drive
Scarborough, Ontario M1C 2G4

VENDOR: Cross cational Software
1802 N. Trenton
Ruston, LA 71270

GENERAL DESCRIPTION

Create-A-Test is a program for creating and maintaining test item files and creating classroom tests or quizzes. An Apple II Plus with 48K memory and DOS 3.3 is required. One disk drive is needed, but two can be accommodated. It is available for about $90. Previously developed item banks in secondary-level subjects of science and social studies are available for about $50 each or five for $200. Each disk has 400 to 500 questions. The program plus four item disks can be purchased for $200.

Three copies of the program and one blank disk are provided with the manual in a padded three-ring binder. Storage folders within the binder can hold eight disks.

Most printers installed for the Apple computer are supported.

ITEM BANK DESCRIPTION

Items of any type can be stored, as well as reading passages or instructions. Items are stored in files called "tests" which can hold up to 32 questions each. Each disk holds up to 14 files. Stems are limited to about 240 spaces, but items may be linked together and need not have response options. This allows the user to file a reading passage, item instructions, or especially long questions. A long question can be continued from the disk space assigned to one item to the space assigned to the next item. When printed, these two "items" will be printed as one. In addition, items may be given an identifying mark indicating that they pertain to the previous item (question, passage, or instruction).

No classification scheme is linked directly to each item, but the developers have allowed for item storage by classification. Each item storage disk may be numbered. Thus users can define their own classification code for each disk. In addition, items may be numbered at the user's discretion. This can provide a further classification scheme. A master list of sub-topics and the item numbers included can be made. Items added to an item bank will automatically go at the end. This order of entry can be overridden in order to place a new item in the proper numbering sequence.

ITEM BANK MAINTENANCE

A full-screen editor with commands similar to the popular package Wordstar is provided. This is easy to learn and easy to use. Control commands are listed at the bottom of the screen while in edit mode. Superscripts and subscripts are supported, as well as lower case.

Item banks are available for purchase in eight secondary subjects (Biology, Physical Science, Physics, Chemistry, Botany, Government, History, and Geography). These provide a total of between 400 and 6,000 items in each subject.

TEST ASSEMBLY

Test items are selected by specifying the number of the question. Items cannot be selected randomly. Selection by classification is done by the instructor by selecting from the user-defined storage system. Unlike some other packages, items are not shown on the screen during the selection process. This greatly speeds selection, but the user must have a hard copy of the item bank in order to know which items to select.

TEST ADMINISTRATION AND SCORING

Tests are administered only by printed copy. No scoring or item analysis is available.

STUDENT RECORDKEEPING

There is no provision for student recordkeeping.

USE

The manual is complete and easy to follow. Sections are clearly titled and there are many diagrams and examples. In fact, most of the 39 pages are examples of printouts or what the screen looks like. Create-A-Test provides great versitility in item storage which adds some complexity to its use. General operations go quickly once the system is understood.

PRODUCT: Exam Builder

VENDOR: A. U. Software
P.O. Box 597
Colleyville, TX 76034

GENERAL DESCRIPTION

Exam Builder is a program for creating and maintaining test item files and creating tests for classroom use. Five files of 150 questions can be stored on one disk. There is no limit to the number of disks used for storage. Only one disk drive is needed, but a printer must be installed for the program to operate.

Nearly any computer available in schools can be used. Versions of the package are available for TRS-80, Commodore-64, Apple II (+, e, and c) and IBM personal computers. The package sells for about $100. The IBM version was used for this review.

ITEM BANK DESCRIPTION

Items can only be of multiple-choice or true-false format. Each question may have two to five responses. Items are stored in "subject" files of up to 150 questions each. Five files can be put on each disk, but there is no limit to the number of disks that can be used. Each question may have up to 244 characters in the stem and a combined total of 244 characters in all responses. If the user exceeds the 244 character limit, the program does not adequately trap the error.

ITEM BANK MAINTENANCE

While entering items, the user may use all the editing keys available with their computer (e.g., IBM PC has cursor control and delete keys) before pressing the Enter| key. After a stem or response option has been entered, it cannot be edited and must be entirely retyped. The limited editing ability of the program is not mentioned in the manual.

The program requires that a printer must be attached and on while the program is being used, an awkward feature. Each item is printed as it is entered. This does provide a written copy of each file, but at the expense of time and paper. An option is provided of also printing out any file or portion of a file at a later time.

TEST ASSEMBLY

Test items may all be chosen from one file or from any number of files. Within a file, items may be chosen randomly or at the user's discretion. Before choosing items for the test, the teacher can write a heading of up to five lines. Each line is automatically centered before printing.

A separate key may be printed after a test or item file. The printing of this key is password protected, as is the changing of the password.

TEST ADMINISTRATION AND SCORING

Tests are administered only by printed copy. No scoring or item analysis is available.

STUDENT RECORDKEEPING

There is no provision for student recordkeeping.

USE

The manual is fairly complete and fairly easy to follow. Some basic information about the program should be included at the beginning and is not. Most of this needed information is in a "Hints and Notes" section on the last page. Much time was wasted before reading that page.

Most decisions required of the user need only a yes or no response. The proper response is "Y" or "N". Any other response, including "y" or "n", produces unpredictable results--often something other than what the user wants; sometimes resulting in a need to reboot, which can erase any newly entered items.

PRODUCTS: Exams and Examiner

AUTHOR: Michael Stoloff

VENDOR: Microsoftware Services
P. O. Box 776
Harrisonburg, VA 22801

GENERAL DESCRIPTION

Exams is a item storage and test construction program. Examiner is an on-line testing program using tests produced by Exams. Banks of multiple-choice items can be produced from which tests or quizes may be constructed.

These packages require a TRS-80 Model 3 or 4. Each package sells for about $70, but both can be purchased for $130. Anyone wishing to examine the package may buy the manual separately for $10.

ITEM BANK DESCRIPTION

Items are stored in a multiple-choice format with five response options. Questions can be extremely long--up to 17 lines. Nearly 260 questions may be stored in a single file. A "keyword" line is available on each item for listing classification titles for later selection. Questions may be copied from a storage file and placed in a test file with page headings and test instructions included.

ITEM BANK MAINTENANCE

An editor is provided for entering, updating, and correcting items. It could be called a "full-line" editor in that editing may be done within any line. Changing more than one line is a little more difficult. Without the manual, use of the editor would be nearly impossible. The editor's menu is confusing and incomplete, as well as poorly structured. For example, any time that an item is added or edited it must be specifically saved. The menu lists " Enter| to continue", but striking the enter key abandons the changes and takes the user to the next menu choice.

TEST ASSEMBLY

Any file on the disk can be considered to be a test. If an item file contains more items than are wished for a test, the desired items may be selected and copied to a new file. Items may be selected by number, by reviewing the file, by random selection, or by keywords. Keyword selection involves the computer searching the file for a specific word or part of a word. The word may be chosen from the item or the "keyword" line. Thus the user may search for any question containing a desired word or for any question stored with a desired classification title. The search may also be limited to just the keyword line.

TEST ADMINISTRATION AND SCORING

Exams prints out a blank answer sheet, a key, and the finished test. This copy of the test can be duplicated and used in the classroom.

Examiner uses the test produced on the Exams disk and administers the test on-line. Immediate feedback is given to each answer. After each test, students are given their scores, the time they took, and the list of answers given and which ones were wrong.

STUDENT RECORDKEEPING

Examiner saves the information given to the student on disk for the teacher. Also recorded are the scores of all students in the class in a gradebook format and some simple statistics for each question--item difficulty and proportion of students selecting each response. Statistics must be computed elsewhere.

USE

A separate manual is provided with each program. This manual is well organized and comprehensive. In addition, the vendor is willing to give assistance over the telephone. The manual and phone assistance are necessary. Though Exams is menu driven, the structure and clarity of the menus are poor. Performing simple actions is difficult to do and often involves excessive time. Examiner, on the other hand, is easy to use and serves a useful purpose by storing student scores and item statistics.

PRODUCT: MicroCAT

VENDOR: Assessment Systems Corp.
2233 University Ave., Suite 310
St. Paul, MN 55114

GENERAL DESCRIPTION

MicroCAT is a highly sophisticated program for computerized adaptive testing. With creative use, this package could also be used for instruction, diagnosis, or mastery learning. Unfortunately, no provision is allowed for printing tests. Four separate programs are available: the item and test development subsystem, the examiniation subsystem, the item and test assessment subsystem, and the test management subsystem. Items can be created and stored, compiled into tests, and presented by computer at stand-alone stations or in a network. The assessment subsystem computes test scores and item and test statistics for computer-presented tests as well as data files created from paper and pencil tests.

An IBM personal computer or similar computer with a color monitor is needed for MicroCAT. No printer is needed; nor can one be used. An advanced graphics editor is included to allow construction of color graphics to accompany or be incorporated into any item. If a mouse is available, it can be used, but is not necessary, though it may speed up the use of the graphics editor. When using the assessment subsystem for computing statistics on large files (such as a school district or large college lecture class), an 8087 co-processor would greatly help.

MicroCAT may be used in multiple-user networks. Subroutines allow for monitoring test taking from a central proctor's command station.

The item and test development subsystem comes with the examination subsystem and the user's manual for $975. If a network is to be used, the test management subsystem may be purchased for an additional $500. The item and test assessment subsystem may be purchased separately for $900. The full package costs about $2,400.

ITEM BANK DESCRIPTION

Items can be stored in two modes: color or black and white. The black and white mode is used strictly for text. Text in that mode can be up to 25 lines of 80 characters each. In the color mode a full-function color graphics editor is available.

Text may be entered in either mode. Text entered in color mode can be of any color desired. Text in either mode may also use up to 124 special characters. The user may create any character or symbol desired. These characters are created with a font generator. The font generator and the large number of characters available provides great flexibility.

The graphics editor is quite similar to MacPaint used on the Apple MacIntosh. The graphics are impressive and can add immensely to a test. Unlike MacPaint, there is no "eraser". Mistakes can only be removed by backing through the file. This process can be quite time consuming (and mistake prone) when many graphic entries must be stepped through.

Any "item" in the file can have any of a variety of uses. An "item" may be a test question, a reading passage, a picture, a chart or graph, or any kind of message or instruction. In order to provide full use for each kind of item, each item is stored with a large list of information.

One important piece of stored information is the item identifier. This code consists of 1 to 6 letters and 1 to 3 numbers. It is primarily useful as a way to designate item clasifications and to number items within classifications.

Items can be linked together. Each item can be stored with the identifier of an item to precede it or to follow, or both. This is most useful when items are to refer to a graph or passage. Items which follow another item can be presented on the same screen. For instance, a graph can be presented and a question may be superimposed over the graph.

Tests can be made to test response time. If the teacher wishes to, items can be presented for a defined period of time. If the student does not answer in time, the item will be removed and the next one presented. This feature can also be used to present a reading passage for a specific length of time.

Lastly, each item can be stored with up to three item parameters to be used primarily with adaptive testing using item response theory. The test manager may use these with the Rasch one-parameter model, a two-parameter model, or the full three-parameter model to select items for a test.

ITEM BANK MAINTENANCE

Items can be added to the file or edited using the graphics editor at any time. The manual does not discuss the number of items which can be stored. It appears that about 175 items can be stored on a disk. This may vary depending on the percentage of graphs stored. Only one disk may be used for a given test. Using a hard disk for item storage would increase the pool size.

Actually looking at a number of items can be difficult. Items cannot be printed. Unlike some other item banking programs, the user cannot scroll through the item file. Each item must be accessed individually using its unique identifier code. Getting a list of valid codes is a two-step process which also cannot be printed (except with the "print screen" function of the IBM PC).

Though the program is generally menu-driven, there are no editing prompts in the text editing mode. This requires keeping the manual close at hand.

TEST ASSEMBLY

Test assembly in MicroCAT is the most advanced of any of the programs reviewed. No other program reviewed used item response theory to produce tests. Six options are available for constucting/presenting tests: three types of conventional test forms and three types of adaptive testing using item response theory. In addition, each item can be calibrated using either a three-parameter model or the Rasch two-parameter model.

MicroCAT uses the Minnesota Computerized Adaptive Testing Language (MCATL) to present its tests. Users are given a complete manual of this language in the user's manual. Those who are not adept at computer programing need not use this language. A compiler is included which allows the user to identify the test type and the items to be used and the computer writes the MCATL program. The MCATL program is used by the examination subsystem when the test is presented.

TEST ADMINISTRATION AND SCORING

Test administration is only on-line. No printed tests can be constructed. Tests can be presented on several computers at once or on one computer. One computer can give one test and stop or give tests consecutively. Presentation is coordinated with a different program disk than is used for editing or scoring, thus students cannot change items or answers.

The examination disk stores a record of each student's responses to each question. A provision is included that allows a student to continue a test if they are interupted before completing the test (such as by a power failure). As student's take a test, their answers are stored in a data file. This data file can be accessed by the item and test assessment subsystem.

The assessment subsystem not only can give total test and sub-scale scores for each student, it can provide a complete range of descriptive and analytic statistics including point-biserial correlations for each item and response, sub-scale intercorrelations, and KR-20.

Lastly, the assessment subsystem can be used to determine validity scores for any test. A multiple regression program is built in which can be used to correlate tests, subscales, and items with a criterion score.

STUDENT RECORDKEEPING

For each student, the number-correct score for each scale can be stored and printed out. If a minimum score is important (such as for competency testing), the MCATL program can be written to determine if the student attained the required level. A message pertaining to the students attainment of the minimum score is also stored.

USE

At first glance, the 174-page manual for MicroCAT is rather overwhelming. Included in the manual is an introduction to adaptive testing and a manual for use of the MCATL test construction program language. Actually, almost all actions within MicroCAT are driven by menus. The manual is easy to read and easy to follow. Due to the complexity of this package, it is important to read the manual first and keep it handy until the commands are well learned. This is most true with the graphics editor where all commands are two-letter codes and there are no on-screen helps in the text mode.

What this package does is very impressive. The use of such advanced graphics and the availability of such complex statistics are not in any other program reviewed here. On the other hand, the program is of limited use beyond computerized adaptive testing. In addition, several problems were found in connection with item construction. These problems are described below.

When first creating an item, the user gives it a unique letter and number code. The letters define an item class. If an error is made when typing the class, that class will be filed onto the disk. The user can change that one item's identifier code, but the incorrect class code will continue to clutter the class code directory. There is no way to remove it.

The manual could be a little more explicit when it discusses the graphics editor. It seems to assume that the user has experienced similar programs. At one point it discusses how to store and execute segments, but does not explain what a segment is. It also warns against improperly executing segments, but does not say how to avoid disaster by properly executing them! While reviewing the program, disaster did occur and we could not correct it, despite many tries.

When compiling a test, one graph would not be accepted by the compiler, apparently due to its size. No explanation is given in the manual and no warning is given in the program that graphics items can fit on the screen and still be unusable due to their complexity.

A final set of major problems involves test assembly. When defining tests, at least three files must be created. These can be confusing, since their purpose is not made clear. If a mistake is made in naming or creating files, the mistake is saved on the disk. The only way to remove the mistake (or any outdated test file) is through the DOS delete/erase function. At one point users can get ahead of themselves and not have created needed files. This error is not trapped. To get out, the computer must be rebooted.

PRODUCT: Multiple Choice Files

VENDOR: Compu-tations
P.O. Box 502
Troy, MI 48099

GENERAL DESCRIPTION

Multiple Choice Files is a simple item storage and retrieval system. Tests can be administered or printed from stored files, but items can not be individually selected from a file. Tests may printed, but the main purpose of the program is to produce on-line testing sessions. Questions are presented randomly, with correct answers reinforced and feedback given for incorrect answers.

The program runs on an Apple II or Atari 800/1200 and sells for about $30. The Apple version was reviewed.

ITEM BANK DESCRIPTION

Question files of up to 30 items can be entered and saved. Only multiple-choice items may be saved. Each question must have five possible response options. No commas, colons, or quotation marks may be used in the stem or responses.

ITEM BANK MAINTENANCE

Items may be added until the 30-item limit is reached. In order to edit an item the entire item must be retyped. Changes are not automatically saved. After all editing is complete the revised test file must be saved.

TEST ASSEMBLY

Items can not be selected from a question file, the test consists of all items in the file. If the test is printed, items are listed in the order entered. If on-line administration is used, items are presented in random order.

TEST ADMINISTRATION AND SCORING

Printed tests are scored manually. An answer key is printed separately after the entire test is printed.

When tests are administered on-line, items are presented in random order. Correct answers are rewarded and incorrect answers prompted with the correct response. Any incorrectly answered question will be presented again. All questions are presented until answered correctly.

STUDENT RECORDKEEPING

With on-line presentation a listing is provided of the name of the quiz, the student's name, the number of items presented, the number of items missed, and the percent correct. The percent is based on all presentations, thus a student may miss all ten questions of a ten-item quiz, get each question correct on the third try and end up with a score of 33 percent (ten right answers out of 30 presentations). There is no provision to determine the student's score based on number correct on first presentation.

Student information listing is intended for use by the teacher to record the student's score. No permanent student record is kept on the disk.

USE

The program uses an easily followed menu format. A short, 6-page manual provides sufficient added explanation. Test files may be protected from editing, but students can take the Review option and see the answers before they are tested. As an on-line testing program, Multiple Choice Files is best used for practice and review or under close teacher supervision.

PRODUCT: P. D. Q. BUILDER

VENDOR: Micro Power and Light Company
12820 Hillcrest Road #219
Dallas, TX 75230

GENERAL DESCRIPTION

P. D. Q. Builder is a test or quiz construction program which allows easy construction of tests for paper or on-line presentation. The user can develop and maintain item banks for testing or review purposes. Tests can be produced on separate disks from the program disk--allowing on-line test presentation with assurance that computer wise students cannot change the program or the questions.

The program is meant to expand on and replace the Adaptable Skeleton, another software product by this company.

This package requires any Apple II computer with either one or two disk drives. It sells for about $45 and includes a comprehensive manual with one program disk and one sample data disk on which the items are stored.

ITEM BANK DESCRIPTION

Items in this system consist of the item stem and answers, as well as written feedback for use with on-line presentation. Items are stored in sets called "worksheets". Each worksheet can hold up to fifteen items. Items are not categorized, but each worksheet can be used to hold a specific category.

Item stems are limited to 200 spaces for true/false and multiple-choice questions and 250 spaces for completion questions. This item length is longer than many packages reviewed. Up to 150 items may be stored on a disk. Unlimited disks may be used when choosing items for a test.

ITEM BANK MAINTENANCE

As with all other aspects of this program, the user is guided through initial item entry by detailed, nested menus. When adding a new item, a series of underlines are shown on the screen that define the length allowed for the stem and response. This feature is helpful in that it gives fair warning when the limit may be exceeded, saving the necessity of re-entering the item if the stem is too long.

Editing features of P. D. Q. Builder are limited. If a change in the stem is needed, the entire stem must be retyped. The same holds true for each response. At least the entire question does not need to be re-entered. Super- or sub-script are not available, but the user may highlight words or passages which appear as bold face when printed.

Each item is automatically saved as it is completed or edited. This prevents accidental loss of items if the user forgets to save or if electrical power is interrupted.

TEST ASSEMBLY

When assembling a new test, the instructor may choose up to 10 items from up to 5 "worksheets" (item sets). Each worksheet may be used as a sub-scale. Items can only be selected randomly from each worksheet. This can be a major problem in that if a worksheet is used as a way of categorizing items, the user must take all of the items in that category or else take "pot luck" on the items chosen. If specific items are needed, those and only those items must be in the worksheet.

Items may be presented either in the order added to the test or in a random order. For paper tests the order can be rearranged to produce multiple forms of the test.

Each test is placed on its own disk. This disk contains programs to allow for item selection, test presentation, and scoring. The item editing program is erased from the test disk. This feature allows the instructor to use a test disk for testing or review with the confidence that no student can change any of the stems or responses.

TEST ADMINISTRATION, SCORING, AND RECORDKEEPING

Test administration may be by standard paper and pencil presentation or by direct on-line interaction with the computer. Printing of items occurs directly from the item bank disk without the need to make a student disk. Entire "worksheets" or randomly selected items may be printed. A separate answer sheet is printed after the questions.

On-line presentation can take two forms: testing or review. The difference being whether the instructor has the program save student records or not. If the student records are not saved, the student may take the test as often as they would like. After each question a short tutorial response is available which can be used to reward correct answers or guide incorrect answers. If student responses are saved, the student must re-run the testing program. The results of the second administration are also recorded.

Records are saved in a password-protected file with each students' name, class period, date test was taken, worksheet (number assigned to the worksheet or "M" for multiple), number of items attempted, and number of correct responses.

USE

A 28-page manual accompanies the program. It gives a complete step-by-step description of how to do each activity. In addition, the user is thoroughly guided by the built-in menus in the program. The manual is necessary only for initial familiarization with the package and for clarification in the rare case that the menu may not be clear enough. The manual itself is clearly written and well organized. The reader can find needed information without having to read excessive pages of material.

PRODUCT: QUIZ RITE

AUTHOR: Richard Vanden Berg

VENDOR: Class 1 Systems
17909 Maple Street
Lansing, IL 60438

GENERAL DESCRIPTION

Quiz Rite is a program for creating and maintaining test item files, based on Test Rite by the same company. Items are stored in multiple-choice format, but may be printed in any format. Essay questions may also be stored. The package is good for regular classroom test construction.

Quiz Rite uses the Apple II line of computers with 48K of memory, one or two disk drives, and virtually any printer. The version reviewed for this report was not complete and had no manual. Suggested retail price is $90. Versions are also available for TRS-80 and IBM PC computers.

ITEM BANK DESCRIPTION

Like Test Rite, items are stored as an open-ended question and potential responses, the correct response entered first. Up to five responses per item are allowed. Each item (including responses) can have up to 243 characters. There is no provision for storing a classification code. Essay questions are stored in a separate file. The user does not need to follow the required format convention, but nonconformity could result in incorrectly worded test questions, if care is not taken when selecting items.

ITEM BANK MAINTENANCE

Items may only be added or removed. There is no full-screen editor. Editing is done by rewriting the stem or a response.

TEST ASSEMBLY

Quiz Rite selects items for a test in a less complicated manner than Test Rite. The user may choose specific items by passing through the file one item at a time and identifying the items to use. This routine may be left at any time without having to pass through the whole file. Items not specified will not be included. The program can also choose items by random selection.

Before printing, the user may add any instructions that are to go on the test. The only additional information printed on the test are the date and the test name and number.

Test item files are stored by both test name and course number, which can provide a kind of classification system.

TEST ADMINISTRATION AND SCORING

Test administration is by printer only. The printed copy is not of the same high quality as with Test Rite. Question sets may be combined so that a long test using a variety of item kinds can be produced. An answer key is printed on a separate sheet.

There is no provision for computer scoring.

STUDENT RECORDKEEPING

There is no provision for student recordkeeping.

USE

Quiz Rite is entirely menu driven. It is very easy to use, but what is gained in increased ease is lost in quality and flexibility.

When choosing from menus, the user is saved the extra keystroke of pressing "return" after each choice. Errors are generally caught by the program, but diagnostics are not provided--you can only try again. One error while testing the program resulted in leaving the program and going back to DOS. This may have been corrected before the production version was finished.

PRODUCT: Teacher Create Series (Multiple Choice)

VENDOR: Educational Courseware
67A Willard St.
Hartford, CT 06105

GENERAL DESCRIPTION

Teacher Create is a set of simple programs for creating and storing complete tests. Tests can be administered by computer or be printed for classroom presentation. Questions are presented in the order they were entered. Response options are presented randomly. With on-line presentation, immediate feedback is given.

The programs run on any Apple computer using DOS 3.3. programs available are: (1) Multiple-Choice, (2) Matching, (3) True and false, (4) Completion, and (5) Question/Answer Utility. The Multiple Choice disk was reviewed.

ITEM BANK DESCRIPTION

Test files of up to 100 items may be entered and saved. Tests can only be composed of the question type served by the specific program. With Multiple Choice each question must have five response options. "None of the above", "All of the above", and similar answers cannot be used since responses are shuffled with each presentation.

The stem cannot exceed three screen lines. Each answer must fit onto one line.

ITEM BANK MAINTENANCE

The editor is quite simple. In order to corrrect the stem or one of the answers. The entire stem or answer must be retyped. Changes are automatically and immediately saved.

TEST ASSEMBLY

Tests are stored in the order they are to be presented. Each item file is a test file. The computer does not select from a large item file to create a new test.

TEST ADMINISTRATION AND SCORING

Tests may be printed for classroom administration. Response options are printed in random order within question, providing slightly different versions if printed more than once. Answers are printed on a separate page.

When tests are administered on-line, correct answers are rewarded with musical sounds and a written phrase such as "Wonderful". Incorrect answers are prompted with the correct response and a different musical sound. At the

end of the test, the student's score is presented on the screen. No record is kept of class scores. With immediate feedback and no recordkeeping, the on-line use of Teacher Create is best for student practice and review.

STUDENT RECORDKEEPING

There is no provision for student recordkeeping.

USE

The program uses an easily followed menu format. An instructional session is included on the disk which basically repeats the information in the three-page manual. Teacher Create is so simple that no further information is needed to use it. Almost anyone could sit down and begin using it immediately. Test files are password protected to prevent unauthorized access by students, but the password cannot be changed.

Using large files is very time consuming. Each time a test/file is accessed it must be loaded into memory. This loading takes about 3.5 seconds per item. Thus, before taking or editing a 100-item test there could be a delay of up to five minutes.

PRODUCT: TAP: Test Authoring Program

AUTHORS: Robert Slaughter, William Holzemer,
Donald Chambers, and Mark Slichter

VENDOR: Addison-Wesley Publishing
Medical-Nursing Division
2727 Sand Hill Road
Menlo Park, CA 94025

GENERAL DESCRIPTION

TAP is an item banking and test authoring program for instructors or testing supervisors at any level. Items of any response format can be classified in up to seven catagories. Passages and graphs may be stored and linked to questions.

An IBM (PC, PC/XT, or PC/AT) computer with at least 152K of memory is required. Graphics can be used, if a compatible printer is available. An Apple version is under production.

TAP is available for $125. This includes the program disk, a tutorial disk, the manual, and three-ring binder. A 30-day moneyback guarantee is included. If after reviewing the tutorial, the purchaser decides not to keep TAP, a full refund is available--providing the sealed program disk has not been opened.

Item banks are available which accompany four textbooks in nursing. These include between 500 and 1,000 items which can be added to and edited at the discretion of the nursing instructor.

ITEM BANK DESCRIPTION

Items are entered into a space 24 lines long and 70 columns wide. With the editor feature, anything can be entered into this space. Generally this will consist of an item stem and responses. Essay and completion items may also be entered. Written passages, graphs, or graphics may also be stored and linked to as many as 20 items. In order to develop graphics and use special characters, the user must be familiar with the entry of ASCII codes with PC-DOS and have a printer capable of printing these special characters.

The item editor is quite versatile. The one short-coming is that no wrap-around feature is included. A bell is sounded when text nears the end of the line, just as with a typewriter. If the end of the line is reached, the cursor will continue the word on the next line. Little effort is needed to edit such broken words. A second problem is that only one character can be inserted at a time before the program reverts back to overwrite mode. Thus, inserting a three-letter word takes six key strokes (pressing "insert" before each letter).

Items are stored with the date they were created, the correct answer (if a multiple-choice item), and up to six different classification areas: content, sub-classification, cognitive level, a user-defined scheme, item difficulty (.00 to 1.00), and item discrimination (.00 to 1.00). Only the content and sub-classification catagories are required, specific labels are determined by the user. Excluding difficulty and discrimination, over 4,000 unique classification codes may be produced.

ITEM BANK MAINTENANCE

Items are entered and edited using the full-screen editing features described above. Only about 160 items may be stored on a disk. This is a major limitation. A 500-item bank would have to be stored on four disks, a 1,000-item bank on seven disks. Multiple disks may not be used when constructing tests--making the large classification scheme of little practical use. All items on a single floppy disk should be in just a few content areas in order to maximize the pool of items for a test. Using a hard disk drive exclusively for item banking would avoid this problem.

Each item disk has its own password and ID. This gives some protection to unauthorized access--unfortunately, if one disk is accessed and replaced with another disk, the second disk can be read and edited.

TEST ASSEMBLY

Test assembly offers a wide set of construction choices. Items are selected by specifying content area and sub-classification. Cognitive level, user-defined catagories, item difficulty and item discrimination may also be used to choose sets of items. TAP then searches for items fitting the characteristics selected. Each item fitting the selected characteristics is shown on the terminal in order for the user to accept or reject. Random selection is not available.

A master copy and answer sheet are printed for each test. A set of instructions for the students is printed at the top of the first page. Individual items from the bank may be printed at any time.

TEST ADMINISTRATION AND SCORING

TAP has no provision for scoring or on-line administration.

STUDENT RECORDKEEPING

There is no provision for student recordkeeping.

USE

A comprehensive 102-page manual comes with the program. It is detailed and easy to read. Several appendixes discuss special topics of item banking such as Bloom's Taxonomy of Cognitive Levels, determining item statistics, and writing multiple-choice questions.

Menus guide the user through each stage of item entry and test development. If the user has a question, the manual can answer it. If the manual is not close at hand, a Help feature can be accessed.

The major problem seen in using TAP was the problem of few items per disk (due mainly to not compressing items) and the associated problem of not being able to use multiple disks to construct a test. A second, more minor, programing problem involves the time required to enter a large number of items. After each item is entered, it must immediately be saved to prevent loss of items. After saving an item, the computer returns to the main menu where the user must again request the item edit mode.

PRODUCT: TestBank

VENDOR: Holt, Rhinehart, and Winston, Publishers
383 Madison Ave.
New York, NY 10017

GENERAL DESCRIPTION

TestBank is an item banking and test construction program powerful enough for testing specialists, but easy enough for classroom use. Previously developed items may be used or new items may be added to the item bank.

This package requires an Apple computer with at least 64k of memory and an 80-column board. It is best suited for the IIe or IIc. Two disk drives are required. Any printer available for the Apple computers can be used, but special characters are only supported on the Epson FX-80 and MX-80, the Imagewriter, and the OKIDATA printers.

No price was available at the time of this writing. The program comes with a backup disk, a comprehensive manual, and the specific item bank(s) ordered.

Another program available from the publisher is Class II. It is apparently intended to be used with TestBank to handle some activities not covered by TestBank, such as computing test scores, maintaining student records, and calculating item statistics. Class II was not reviewed at this time.

ITEM BANK DESCRIPTION

Items are entered as one continuous question. Stem and responses are entered together. This allows the "item" to be used as a passage or essay question. Passages may be up to 54 lines long. If they exceed the maximum item length, a second (or third) consecutively numbered item may be used to continue the passage. Any item may be linked to a passage. When printing a test with a linked item, the computer will first print the passage.

Each item is stored with a four-digit objective number and an optional four-digit objective type. Up to ten items may be stored per objective number on a given disk.

Item disks are password protected and hold between 200 and 1,000 items, depending on average question length. The fifth grade mathematics disk reviewed contained approximately 400 items and was about one-half full.

ITEM BANK MAINTENANCE

Items are entered and edited using full-screen editing features. Line wrap, insert, delete, and full cursor movement are provided. Hard returns can be included at any place—and are needed in order to locate the answer options properly.

Users can use upper and lower case, underlining, and superscripts; as well as a long list of mathematical symbols including Pi and square root. Most of these characters are rarely seen in other programs. All special charaters are also available on the II+, despite its limited keyboard.

TEST ASSEMBLY

When constructing a test, the instructor has several options available. Tests can be composed of items selected randomly from the bank, or items can be selected from specified catagories. Selection within catagory can be either random or user-guided. Unlike many programs, items cannot be scanned as they are selected.

A master copy and answer sheet are printed for each test. If the user wishes a copy of items in the bank, they may be printed. Maintaining a hard copy of the item bank is necessary in order to select items for tests.

TEST ADMINISTRATION AND SCORING

Testbank has no provision for scoring or on-line administration. Class II, a compatible program from Holt, Rhinehart, and Winston, uses TestBank item files to construct and score on-line tests.

STUDENT RECORDKEEPING

There are no provisions for student recordkeeping within this program. Again, they are available with Class II.

USE

A 58-page manual comes with the program and item disks in a hard case. The manual is detailed and easy to read. All aspects of the program are carefully described.

TestBank uses its own disk operating system--increasing speed and security and providing the special character features.

For the most part, the program is easy to use, being menu driven. Initially some confusion can develop over the meaning of some words in the menus. Reading the manual is important in order to prevent confusion. Once the meanings are clear, the program runs quite well.

PRODUCT: TEST RITE

AUTHOR: Richard Vanden Berg

VENDOR: Class 1 Systems
17909 Maple Street
Lansing, IL 60438

GENERAL DESCRIPTION

Test Rite is a program for creating and maintaining test item files. Items are stored in multiple-choice format, but may be printed in any format. Essay questions may also be stored. The package is excellent for regular classroom test construction.

Test Rite uses the Apple II line of computers with 48K of memory, one or two disk drives, and virtually any printer. It is priced at $139 and comes with a well-organized, comprehensive manual including many example tests and a quick reference card of program menu options and commands. Versions are also available for TRS-80 and IBM PC computers.

ITEM BANK DESCRIPTION

Items are stored as an open-ended question and potential responses, the correct response entered first. Up to five responses per item are allowed. Each item (including responses) can have up to 243 characters. Items may be given a four-character reference number for classification or other identification. Essay questions are stored in a separate file. The user does not need to follow the required format convention, but nonconformity could result in incorrectly worded test questions if care is not taken when selecting items.

ITEM BANK MAINTENANCE

Items may only be added or removed and given reference numbers. These reference numbers may be changed at any time. There is no full-screen editor. Editing is done by rewriting the entire stem or response.

TEST ASSEMBLY

Test Rite selects items for a test in a manner different from other similar programs which adds time, but saves disk space. The user must pass through the item bank file and identify which items are not to be included in the printed test. A second pass allows the instructor to select by classification from the remaining items. This second pass is completed by a series of greater-than and less-than commands which select from among the available reference numbers. If two items have the same reference number, they will both be selected.

Before printing, the user may add additional information to be printed on the test, such as the school name and course name and instructions up to 250 characters long. Pre-written instructions are available for all types of questions, with variations for those answered on paper or on machine graded cards.

Test item files are stored by both course name and course number.

TEST ADMINISTRATION AND SCORING

Test administration is by printer only. The printed copy is ready for use without further retyping. Question sets may be combined so that a long test using a variety of item kinds can be produced. An answer key is printed on a separate sheet.

There is no provision for computer scoring.

STUDENT RECORDKEEPING

There is no provision for student recordkeeping.

USE

Test Rite is entirely menu driven. The accompanying manual is complete and well organized. Anything not clear from the menus can be quickly understood from the manual. The author even includes suggestions for developing tests, such as finding good distractors for multiple-choice items and procedures for computing split-half reliabilities.

When choosing from menus, the user is saved the extra key-stroke of hitting "return" after each choice. Errors are caught by the program, but diagnostics are not provided--you can only try again.

PRODUCT: Testmaster

AUTHOR: Michael W. Horner

VENDOR: Midwest Software
P.O. Box 214
Farmington, MI 48024

GENERAL DESCRIPTION

Testmaster is a program for creating and maintaining item files and creating test files from those item files. This program is useful for producing regular tests in the classroom, saving much test compilation time. Alternate tests forms may be created to reduce classroom cheating.

This package runs on Apple II, Commodore 64, or CBM computers. It is set up for one-drive systems and does not expand to two drives. It is priced at about $35 and includes one copy protected program disk and an 18-page manual in a convenient storage folder.

ITEM BANK DESCRIPTION

Items are stored in up to three files per disk, with up to 65 items per file. Thus up to 195 items may be stored on an Apple disk. Commodore users can store up to 80 items per file and 240 per disk. Files are stored in reserved blocks on the disk, saving additional retrieval time by compressing edited files.

Item stems can contain over six lines of material--much more than many similar programs. Item type must be homogeneous within a file. Multiple choice, true/false, and completion questions may be used, but only one kind may be used in a given file.

ITEM BANK MAINTENANCE

A full-screen editor is provided to assist in adding and editing items. It is easy to use and provides a command line at the bottom of the page to assist in choosing the correct commands.

Multiple choice questions may have between 2 and 5 responses. A true-false question is, in effect, a two-response multiple-choice question. Completion questions are stored as if they were one-response multiple-choice questions. Correct answers must be entered first. This saves the step of identifying the right response. When presented, the item responses are scrambled.

After ten items are entered they are automatically saved. If the user wishes to save new items or changes more often, that can be done.

TEST ASSEMBLY

Tests can be composed by randomly selecting a specified number of items from each of up to 10 item files, up to 100 items per test. Provision is given to select specific items. This is done by scrolling through the entire file selecting or rejecting each item one at a time, which can be time consuming in a large item file.

Items are then randomly ordered with responses also randomized within each question; providing for multiple copies of the same test at no extra effort.

TEST ADMINISTRATION AND SCORING

The primary use for Testmaster is to produce printed tests. After assembling a test, the printed version is a random presentation of the selected items. Multiple randomized copies may be printed. No provision is provided for linking groups of items together. The program is designed to work with almost all available printers.

When printing the test, the answer key and a student response sheet are also printed. The student response sheet is simply a sheet with room for the student's name and a series of numbers followed by blanks on which to write the answer. This is most useful for short answer questions because the test question sheet does not provide spaces between items. One shortcoming to the printing subroutine is that the user must stop after each page and advance the paper manually.

STUDENT RECORDKEEPING

There is no provision for student recordkeeping.

USE

Though the program is menu driven, some menu commands are not self-explanatory (e.g., "spool" means print item file). Thus the manual is important to keep handy. Unfortunately the manual is not organized in a clear and useful manner. One manual serves both Apple and Commodore users. In addition, it is written as one continuous section. If it were not for an index, finding information would require reading the entire 16-page manual.

Once the commands are understood, the program is quick and easy to use. Owners of two-drive systems may be a bit frustrated at having to repeatedly switch disks. An item review feature is handy. It shows each item on the screen one at a time beginning with a given item. Presentation is automatic and the user can stop reviewing at any time or pause to edit.

All errors encountered while reviewing this program where caught. In addition, after most menu choices, the user can opt out of the choice and return to the menu. This approach prevents being trapped into doing something not desired.

PRODUCT: Testmaster Series

VENDOR: D.E.C. Computing
5307 Lynnwood Drive
West Lafayette, IN 47906

GENERAL DESCRIPTION

The Testmaster Series is a series of item banks in algebra, geometry, and chemistry at the high school level. They are intended to be used with a word processor package such as "Wordstar" or "EasyWriter". The word processor is used to edit questions and add new items, printing out the final test.

Item sets are available for schools with the IBM PC or PCjr and cost about $20 each.

No copy of the item bank was available for review.

D.E.C. Computing also has a program called "Gradebook" available for TRS-80, IBM, and Apple computers. It can handle up to 60 grades for up to 400 students. Grades are kept for individuals and classes. Grades may be weighted according to any formula. It sells for about $35.

PRODUCT: TESTS, CAICREAT, CAITAKE

AUTHOR: Jerome Thayer

VENDOR: EduSystems
3224 Lakeland Drive
Berrien Springs, MI 49103

GENERAL DESCRIPTION

TESTS is an item authoring and test construction program for classroom use. CAICREAT and CAITAKE are programs for creating and administering on-line quizzes and tutorials.

These packages are available for the IBM PC or compatible computer with 128K memory and one disk drive. TESTS is available alone for $75. All three programs sell as one package for $100.

ITEM BANK DESCRIPTION

TESTS creates item files limited in size only by disk storage limits. Each item can have up to fifty 70-column lines for the stem and all responses. This allows room for passages or graphics within the item. A variety of graphics symbols and special characters can be embedded in an item to display on the screen or print. The program automatically creates a second file which holds a list of objectives which are linked to each item. These objectives can be of any form desired by the user.

ITEM BANK MAINTENANCE

Item files may be created or modified at any time. A full-screen editor is provided with its commands readily visible on the screen for quick reference. The major shortcoming of the editor is that there is no wrap-around. This problem is easy to adjust for since the test questions print exactly as viewed.

Items may be copied to other files and parts of files can be merged to form new tests as desired.

Correct answers are stored in a separate file from the items. While entering the answers, the user cannot see the item (unless it was first printed).

When editing items in an existing file, the user must either remember the exact name of the item storage file or ask for a list of files. How to get that list is not readily apparent, but easy to do once learned.

TEST ASSEMBLY

Actual test construction is done at the time of printing or presentation. Before printing, the instructor makes an item selection file using TESTS. This file identifies which objectives and items within objectives are to be used. The instructor can also choose items randomly within objective.

When choosing items or labeling categories, a block search feature is very useful. This feature allows the user to look for any word or part of a word in all items in the file. Thus if the instructor wants to find all the items in a history file which mention George Washington, the computer can be used to search for the string "Washington".

TEST ADMINISTRATION AND SCORING

CAICREAT constructs command files used by CAITAKE to give the test previously constructed with TESTS on the computer, either as a test or a tutorial. CAITAKE could not be evaluated. An apparent bug in the program or a damage to the disk prevented progress within the program past the first decision point.

According to the manual, students are given items in the order they are stored within each objective, with a choice after each item to continue in that objective or to go to a new one. Students are given feedback after each response. This feedback is very flexible and is designed by the instructor. As items are presented, a tally is kept on the screen of the number and percentage of items on the current objective which have been answered correctly on the first attempt.

Printing tests with TESTS is very easy. Before printing, the file can be amended to provide ready-to-use tests--with one exception. In order to use items with CAITAKE the first letter of the first line in the item must be the answer of the multiple-choice question. This letter will be printed, and thus must be removed before copying.

STUDENT RECORDKEEPING

No mention is made in the manual of storing student records.

USE

The set of three programs comes with a 15-page manual which adequately covers the information needed to use the programs. The programs, though menu driven, require keeping the manual close at hand. Though the package provides a variety of features not generally found in similar programs, the user must be quite familiar with the operation of the IBM-PC. Some familiarity with PC-DOS is necessary. Users with the most experience with the disk operating system will be able to make the most use out of the program. In addition, several apparent bugs still exist.

PRODUCT: Tests Made Easy

AUTHOR: Don Krafcheck

VENDOR: Compu-tations
P.O. Box 502
Troy, MI 48099

GENERAL DESCRIPTION

Tests Made Easy is an item storage and test construction program. Tests are produced by printer for classroom use. There is no provision for on-line presentation. Questions may be chosen randomly or by number.

The program runs on the Apple II computer with either one or two disk drives and sells for about $30.

ITEM BANK DESCRIPTION

Question files of up to 300 items can be entered and saved. This program is designed to handle questions of the short answer, completion, or essay variety. Questions may have up to 600 characters. Answers may be stored with the questions. These, too, may have up to 600 characters. The user may also specify the number of blank lines to follow the question when printed. Thus, essay and short answer questions may be included in the same test without having to retype the test.

ITEM BANK MAINTENANCE

No editor is provided with the package. This means that even long questions must be typed perfectly or be entirely retyped. In addition, no commas or colons may be used in the question.

TEST ASSEMBLY

Tests may be assembled from an item file randomly or by selecting specific items. When selecting specific items, the user may designate item numbers or scroll forward or backward through the file to identify questions.

Multiple forms may be printed by forming an item file with the exact items desired and then twice selecting all of the items randomly. This provides two tests with different item order.

TEST ADMINISTRATION AND SCORING

All tests are administered manually. Printing is rather slow. There is no provision for on-line presentation.

STUDENT RECORDKEEPING

No provision is made for storage of student records.

USE

The program uses an easily followed menu format. A short manual explains most that the user needs to know. For what it does, Tests Made Easy is easy to use—though the printing is slow and there is some delay in file retrieval.

PRODUCT: TestWorks

AUTHORS: Mark Sweetnam, William Knight, and Philip Roth, Jr.

VENDOR: Milliken Publishing Co.
1100 Research Blvd.
P. O. Box 21579
St. Louis, MO 63132

GENERAL DESCRIPTION

TestWorks is a program for creating and maintaining item bank files. It can be used to print regular classroom tests. On-line use include producing regular tests and minimum competency tests or to aid in mastery learning by allowing students to review their answers.

TestWorks is available for any Apple computer with a minimum of 64K memory. Either one or two disk drives may be used. The program sells for about $250 and includes a manual, an instructor disk and backup, a blank item disk, a classroom disk, a help disk, and a tutorial disk; all in an 8 1/2" by 11" binder. Extra disks and material may be purchased for $10 to $60.

ITEM BANK DESCRIPTION

Items are stored in multiple-choice format. Up to five responses are allowed and each item may have up to five lines in the question. Each item bank disk can hold up to 300 items. A code (digits or letters) of up to 14 characters can be given to each item. With this code, teachers can classify items with minute detail. Each item is also stored with an estimated difficulty rating. These ratings are on a scale of 0.2 to 5.0.

ITEM BANK MAINTENANCE

A minor shortcoming of TestWorks is the item editor, though actually having an editor puts this program above several others reviewed. Item lines do not wrap around when entered. If several words need to be deleted, the rest of the item should be retyped in order to maintain the question's appearance and readability.

Many programs with word wrap use the hard return to end entry. With TestWorks hard returns simply move the cursor. This allows construction of items unavailable with other programs, such as mathematics problems in a vertical format.

The strongest aspect of TestWorks is the system built in to maintain item records. For each item, the computer records the number of times that each item was presented in an on-line test and how often each response was given. In addition, the item difficulty estimate is adjusted with each use. This adjustment may be turned off; based simply on the percent of correct responses; based on percent correct and the total score of each student; or be based on percent correct, total score, and an adjustment for guessing.

Records are also maintained for each defined test. The user may obtain the mean, the standard deviation, and the minimum and maximum test scores obtained to date. The computer also lists the name of the student with the highest raw and adjusted scores. A separate listing provides the same statistics for the difficulty ratings of the items in the item file.

TEST ASSEMBLY

Tests may be selected in almost any manner imaginable. The instructor may select specific items from the file to be used on a test. The computer can be told to select randomly from the file. Selection can also be based on a range of item difficulties or on item classification codes (or portions of the codes). All of these approaches to test construction may be used in combination. If desired, a teacher may identify a few items that definately will go on the test, and then allow the computer to choose randomly from a set of items identified by difficulty and code. Parallel tests may also be constructed. In this case the computer randomly selects items in such a way that the average difficulty of the test is equal to the average difficulty of the file. Tests can also be sorted by item difficulty so that the test gets harder as the student answers more questions. Item difficulty can also be used to create parallel tests using different items of similar difficulty.

TEST ADMINISTRATION, SCORING, AND RECORDKEEPING

Tests may be presented by paper or directly on the computer. When using the computer, the student uses a classroom disk and the item file disk. These are very secure. Given just these two disks, a student can take a test virtually unsupervised. If the school has several Apple computers, copies of the appropriate disks may be made and the test given on more than one computer at a time. If a student removes a disk or turns the computer off before completing a test, the disk is "locked" and can only be used again after the teacher uses the main program disk to unlock it. This discourages cheating and tells the instructor that a student failed to complete the test.

When taking a test at the computer, the student has the option, at the teacher's discretion, to skip items. Skipped items may be answered when the other items are completed or the student may choose to not answer those questions. Teachers may also choose to use a test as a learning experience. In such instances, the students may review their incorrect answers after completing the test and learn from their mistakes. Instructors may also allow the computer to give immediate feedback after each question. This feedback can be changed at any time.

Printed tests include a separate answer key for the teacher's use. Tests presented by computer are automatically scored. After taking a test, each student is immediately presented with their score. This is stored on the classroom disk for the teacher to access later. In addition, descriptive statistics are maintained on the entire class.

Tests are scored in six ways. Three ways are based on the total number of items in the test (absolute score); the other three ways are based on the number of questions answered (relative score). These two sets of scores only differ if students are allowed to, and choose to, skip items. Absolute and relative scores are given in terms of (1) the raw score, (2) the adjusted score, and (3) the weighted score. The raw score is just as it sounds--simply the percent correct. The adjusted score is only used when parallel tests are used; it is based on the average item difficulty and helps adjust for slight differences between test forms. Lastly, the weighted score is based on the difficulty of the items answered correctly. High weighted scores can point out good students who answered carelessly (getting hard items right and easy items wrong). If the entire class has high weighted scores, it may indicate that the initial estimate of item difficulty was incorrect and needs to be adjusted.

Tests presented on paper can still be included in the item statistics and student records. In such situations the instructor must enter each student's answers by hand. This can be time consuming, but does allow for updating item difficulties and maintaining records. Some of the diagnostic aspects of the TestWorks score reporting could make hand entry worthwhile.

USE

A 51-page manual accompanies the various program disks. It is clearly written and well organized. Each aspect of TestWorks is laid out in a step-by step manner. Menus guide the user through each step. If at any time the user is unclear about what a menu item refers to and does not want to look it up in the manual, a separate help disk is available. It can be accessed from each menu, at which time only information on that menu will be given. In all, TestWorks is easy to use and quick to produce tests. It does not have all the features of a program like MicroCAT, but it does produce usable tests with the additional feature of item statistics at a reasonable price.

PRODUCT: THE SAGE

AUTHOR: Paul Cozens

VENDOR: Jagdstaffel Software
645 Brenda lee Drive
San Jose, CA 95123

GENERAL DESCRIPTION

The Sage is a program for creating and maintaining files of tests. It is intended for use "in home, school, or industry", but is most practical in the home or elementary classroom.

This program is written for an Apple II+ or IIe computer with 48K of memory. Two disk drives are required.

It can be purchased for about $62 and comes with a program disk, a work disk and a 52-page manual.

ITEM BANK DESCRIPTION

Up to eight tests of up to 25 questions each may be stored on a disk. Items can be written in many forms (multiple-choice, true/false, completion). Items are entered with (1) stem, (2) response options in one list, (3) the number of correct responses possible, and (4) the correct responses. The stem is limited to six lines. Responses may be very lengthy, but when entering them the user must pad with blanks instead of hitting "return" if one response per line is desired. There is no provision to provide multiple correct responses to a single completion response. If, for example, the correct response to a question is "two", the user cannot allow for a student who types in "2". The computer will count it as wrong. Completion items may have more than one blank, and thus the question may have several separate answers.

ITEM BANK MAINTENANCE

Items may be added or deleted at any time.

There is no editor included in the package. If an item includes an error, it must be entirely reentered. The return key is used to terminate entry of stem and answer. Questions print as shown on the screen, so each line must be padded with blanks in order to read correctly.

TEST ASSEMBLY

Item files are tests. Further selection is not provided. If an item stored in a test is not wanted, it must be deleted before presenting to the students. A provision is allowed to copy a test--but it is complicated and not clearly described in the manual or on-line menus. A copied test could have items deleted and still allow for those deleted items to be stored on the disk--in the original copy.

TEST ADMINISTRATION AND SCORING

The Sage is designed for on-line administration and scoring. Its best use is for review and practice. Any student using the program can choose between "studying" a test or "taking" a test. Thus they can see the correct answers before actually taking the test. The program does record each student's score on every attempt at each test--with separate records for review mode and test mode. Thus an instructor can keep track of each student's activities with The Sage and how well they did with and without reviewing the answers.

Since questions may have more than one answer, two scoring methods are available. One method gives each question equal weight in computing the total. With this first method a ten-question test would give ten points to each question whether there was one answer or five in any question. The second method allots equal points to each answer. In a ten question test with a total of twenty answers, each answer would be worth five points. These options are most worthwhile when the test contains completion questions with more than one blank.

Test items can be printed, but the printed copy includes the answers. Printing tests are useful for saving a hard copy, but not for class presentation.

STUDENT RECORDKEEPING

Student records are maintained of the most recent scores on each test. Up to 50 student records are allotted. Each student has access to only their own record and cannot change it. The teacher can view all records, as well as performing initial set-up and file cleaning. The teacher gains access by a password that is fully visible when entered--threatening its security, though it can be changed.

USE

The manual accompanying The Sage is well organized, but written as a tutorial. Finding specific information in it is difficult. It is unclear on some basic topics such as how questions are formatted and scored--making initial use especially confusing. One section describing the complicated procedures for copying a test was actually incorrect.

Item entry is awkward since words are broken at the end of the line and not at the end of the word. The user has to type in the question with padded blanks in each line in order to make the question readable, since a return will terminate entry.

Much of the program contains unnecessary repetition. Many routines end by putting you back to the initial log-on instead of the main menu. Before you are shown a menu, you must type in the code for "show menu". This is a waste of time and program length. Whenever a new question is added to a test, the user must again declare the scoring procedure. This should be in a separate routine.